

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id **4581M** Component **Diesel Engine** Fluid

## PETRO CANADA DURON SHP 15W40 (5 GAL)

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

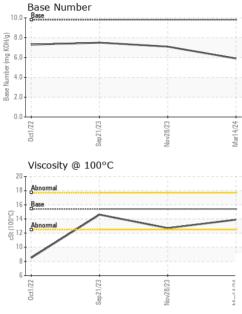
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0115118	GFL0097732	GFL0084952
Sample Date		Client Info		14 Mar 2024	28 Nov 2023	21 Sep 2023
Machine Age	hrs	Client Info		23775	23175	22656
Oil Age	hrs	Client Info		600	519	1370
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ATTENTION	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	0.7
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	53	50	42
Chromium	ppm	ASTM D5185m	>20	2	4	2
Nickel	ppm	ASTM D5185m	>2	<1	1	0
Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	<1	0	1
Aluminum	ppm	ASTM D5185m	>20	4	3	<b>1</b> 4
Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Copper	ppm	ASTM D5185m	>330	2	13	7
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
				•	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm		limit/base		-	-
		method ASTM D5185m		current	history1	history2
Boron	ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 11	history1 2	history2 4
Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 11 2	history1 2 0	history2 4 0
Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 11 2 63	history1 2 0 65	history2 4 0 65
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 11 2 63 <1	history1 2 0 65 2	history2 4 0 65 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	current 11 2 63 <1 897	history1 2 0 65 2 858 1055 896	history2 4 0 65 1 1002 1201 1080
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 11 2 63 <1 897 1164	history1 2 0 65 2 858 1055	history2 4 0 65 1 1002 1201
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 11 2 63 <1 897 1164 1004	history1 2 0 65 2 858 1055 896	history2 4 0 65 1 1002 1201 1080
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           11           2           63           <1           897           1164           1004           1210	history1 2 0 65 2 858 1055 896 1196	history2 4 0 65 1 1002 1201 1080 1346
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 11 2 63 <1 897 1164 1004 1210 2880	history1           2           0           65           2           858           1055           896           1196           2494           history1	history2 4 0 65 1 1002 1201 1080 1346 3477
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current           11           2           63           <1           897           1164           1004           1210           2880           current	history1 2 0 65 2 858 1055 896 1196 2494 history1	history2 4 0 65 1 1002 1201 1080 1346 3477 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base	current           11           2           63           <1           897           1164           1004           1210           2880           current           7	history1           2           0           65           2           858           1055           896           1196           2494           history1	history2 4 0 65 1 1002 1201 1080 1346 3477 history2 ▲ 33
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1	history2         4         0         65         1         1002         1201         1080         1346         3477         history2         ▲ 33         9         6         history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current         1	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1         0.8	history2         4         0         65         1         1002         1201         1346         3477         history2         ▲ 33         9         6         history2         0         0         0.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current         1         12.9	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1         0.8         11.2	history2         4         0         65         1         1002         1201         1346         3477         history2         ▲ 33         9         6         history2         0         0         0         0         33         9         6         0.6         10.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current         1	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1         0.8	history2         4         0         65         1         1002         1201         1346         3477         history2         ▲ 33         9         6         history2         0         0         0.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 225 20 20 1imit/base >20	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current         1         12.9	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1         0.8         11.2	history2         4         0         65         1         1002         1201         1346         3477         history2         ▲ 33         9         6         history2         0         0         0         0         33         9         6         0.6         10.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >20 <b>imit/base</b> >20	current         11         2         63         <1         897         1164         1004         1210         2880         current         7         6         4         current         1         12.9         24.9	history1         2         0         65         2         858         1055         896         1196         2494         history1         16         94         6         history1         0.8         11.2         21.3	history2         4         0         65         1         1002         1201         1080         1346         3477         history2         ▲ 33         9         6         history2         0.6         10.4         21.5



# **OIL ANALYSIS REPORT**

VISUAL



		VISUAL		method	limit/base	current	history1	history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
8/23 -	4/24 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nav28/23	Mar14/24	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		13.9	12.7	14.6
		GRAPHS	001	A0110 0443	10.4	10.0	12.7	14.0
		Ferrous Alloys						
		<sup>60</sup> T						
Nov28/23 -	VCIVE	50 - iron iron						
Novi	h.fl.	40 -						
		톱 30						
		20-						
		10						
				and	Charles and the second s			
		0ct1/22 -		8/23 -	4/24 .			
		0ct Sep2		Nov28/23	Mar14/24			
		Non-ferrous Meta	ls					
		14 copper		~				
		12 - Lead						
		10-	/					
		md 8						
		ă 6-		$\sim$				
		4						
		2						
					*****			
		0ct1/22 Sep21/23		Nov28/23	Mar14/24			
		60		Nov	Mar			
		Viscosity @ 100°C	2			Base Number		
		20 Abnormal			10.0	Base		*****
		18 - Abnormal		1	~ 80-			
		16 Base			B/HO>			
		Co 14 Abnormal			(D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D) (D)HOX (D)HOX (D) (D)HOX (D)HOX (D) (D)HOX (D)HOX (D)HOX (D) (D)HOX (D)HOX (D)			
					la E 4 0.			
		10			N Se N			
		8			<sup>66</sup> 2.0			
					0.0-			
		64		53		0ct1/22 -	Sep21/23 - Nov28/23 -	
		1/23 -		200		5	p2	
		0ct1/22		Nav28/23	Mar14/24	0	No. No.	
		õ						
4	Laboratory Sample No.	ة WearCheck USA - 50 :		n Ave., Cary	, NC 27513		vironmental - 40	)5 - Arbor Hil
	Sample No.	<ul> <li>WearCheck USA - 50</li> <li>: GFL0115118</li> </ul>	Recei	n Ave., Cary i <b>ved</b> : 21	r, NC 27513 Mar 2024		<b>ivironmental - 40</b> 7	<b>)5 - Arbor Hi</b> l 400 Napier F
		<ul> <li>WearCheck USA - 50</li> <li>: GFL0115118</li> <li>: 06124727</li> </ul>	Recei Teste	n Ave., Cary i <b>ved</b> : 21	, NC 27513	GFL En	<b>ivironmental - 40</b> 7	
NELLEONITORY ficate L2367	Sample No. Lab Number Unique Number Test Package	<ul> <li>WearCheck USA - 50</li> <li>: GFL0115118</li> <li>: 06124727</li> <li>: 10938878</li> <li>: FLEET</li> </ul>	Recei Teste Diagr	n Ave., Cary ived : 21 id : 22 nosed : 22	r, NC 27513   Mar 2024 2 Mar 2024 ! Mar 2024 - We	GFL En	<b>ivironmental - 40</b> 7 NO Contact: An	0 <b>5 - Arbor Hi</b> l 400 Napier F RTHVILLE, I US 4816 thony Hopki
discuss this	Sample No. Lab Number Unique Number Test Package sample report	<ul> <li>WearCheck USA - 50</li> <li>: GFL0115118</li> <li>: 06124727</li> <li>: 10938878</li> </ul>	Recei Teste Diagr	n Ave., Cary ived : 21 d : 22 nosed : 22	r, NC 27513   Mar 2024 2 Mar 2024   Mar 2024 - We 9.	GFL En	<b>ivironmental - 40</b> 7 NO Contact: An	<b>)5 - Arbor Hil</b> 400 Napier F RTHVILLE, I

T